

## On Phoridae (Diptera) from Sawfly Cocoons (Hym.: Symphyta)

By ANDREW D. LISTON \*

During the winter of 1977/78 I made several trips to collect cocoons of *Cimbex femoratus* (L.) from a birch wood known as the "Bell" in the upper Whitadder valley, East Lothian (OS map reference NT 6763).

The cocoons of *C. femoratus* are cylindrical, with bluntly rounded ends, a rough outer surface, sometimes with fragments of vegetable debris attached to the outside. The inner surface is smooth and glossy, the whole cocoon is brown in colour and has a mean length of 2.5 cm. They are almost always formed in soil, or leaf litter, not more than a few inches away from the base of the host tree and seldom very deeply. Only once have I found a cocoon in a crevice on the trunk of a tree. This cocoon was unusually thin so as to be slightly translucent, the outline of the prepupa could be clearly seen. Possibly the larva had been unhealthy and lethargic. This may have caused it to build its cocoon before reaching the foot of the trunk. The prepupa did in fact die several weeks later. The fabric and structure of a normally formed cocoon cause it to be extremely hard and strong. The adult makes use of its large and powerful mandibles to bite its way from the cocoon in late May or early June.

Fourteen cocoons, not including that which is mentioned above, were collected at the Whitadder locality. Six had been vacated by sawflies. Five bore roughly circular emergence holes near one end and contained the remains of thin, white silk cocoons which were almost certainly made by *Opheltes glaucopteros* (L.), a solitary Scolobatine (Ichneumonidae) parasitoid often recorded in birch woods and noted as endoparasitic in the prepupae of *C. femoratus* (Gauld and Huddleston, 1976). Two cocoons produced adult sawflies. The last cocoon was completely intact and was found to contain nearly forty Diptera puparia of the cyclorrhaphous type. These were found adhering to the wall of the cocoon both singly and in small clusters. The remains of the *Cimbex* prepupa were lying flat against the wall of the cocoon. The head was complete, but presented a deformed and collapsed appearance. The skin was intact and still retained a green colour and signs of the black dorsal band to be found on the larvae of *C. femoratus*.

The Diptera puparia were identified by Mr. K. G. V. Smith as belonging to Phorids, almost certainly of the genus *Megaselia*. Unfortunately, all the puparia had been vacated. Mr. Smith was therefore unable to state definitely to which species the puparia belonged, but thought it most likely that they were puparia of *Megaselia giraudi* Egger. *M. giraudi* has been reared from a variety of moribund insects. Mr. Smith

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informs me (*pers. comm.*) that Lundbeck (1922: p. 205) records *giraudi* from a cocoon of *Cimbex variabilis* (= *femoratus*). Mr. Smith also informs me of the following published records. Aldrich (1892) describes *Megaselia setacea* and *Phora cimbicis* (the latter is in fact *Doplonevra funebris* (Meigen)) and records *M. agarici* Lintner all from *Cimbex americanus*. Hsin (1935) records *M. ruficornis* Meigen from a pupa of a *Diprion* species. Benson (1950) omits any mention of Phoridae.

Dr. Disney (*per. comm.*) has compared my empty puparia with specimen puparia of *M. giraudi* in his collection. He informs me that they are similar to those of *giraudi*, but probably belong to another related species of *Megaselia*. My specimens would appear to differ from those of *giraudi* in having the lateral processes a little larger and the postero-lateral processes set at a different angle.

I regard the presence of Phoridae in the cocoons of sawflies as merely fortuitous. It would seem most likely that the adult Phorid finds a sawfly burrowing in soil in order to pupate. The Phorid may then "mistake" the larva for being moribund and oviposit in it. It would appear to be significant that only sawflies pupating underground are affected, at least on present evidence. I have collected over a hundred and fifty cocoons of *Trichiosoma lucorum* (L.) (= *latreillei* Leach), from the branches of birches at the Whitadder and seventeen other similar localities and have found no evidence of Phoridae in any of these cocoons. *T. lucorum* is closely related to *C. femoratus* (both belonging to the Cimbicinae of the Cimbicidae) and the only major biological difference occurring between them in the cocoon stage is in the different sites chosen for the cocoon.

My objection to the sawfly larva having been moribund when attacked by the Phorid is that dying larvae seldom manage to produce an adequate cocoon. The development of the Phorid larvae after oviposition is presumably quite similar to that of certain parasitic Hymenoptera. But I consider it impossible that the adult flies could make an exit from an intact cocoon of the sort constructed by *Cimbex*, their mouthparts would be totally inadequate. The complete absence of dead flies was initially puzzling. I now feel that the dampness released from the dead sawfly prepupa was sufficient to decompose the bodies of the flies.

Further observations on Phorids bred from sawfly cocoons would obviously be of considerable interest on several counts, but to the present author it would seem an impossibility for these insects to develop an obligate parasitic habit (or even a successful fortuitous one) where the cocoons of sawflies are concerned. It should be noted that Dr. Disney considers (*pers. comm.*) that the flies may have emerged successfully, and that they were present as obligate parasitoids. Either opinion may be the correct interpretation of the situation.

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EUPITHECIA PHOENICEATA RAMBUR IN EAST KENT. — A single specimen of this species was taken in my Robinson trap on the night of 15/16 August 1979 in Kingsdown, near Deal, Kent. A second specimen arrived on the night of 5/6 September, this unfortunately though escaped. The trap was run up to the 2/3 of October in the same locality, however no further specimens were seen, neither did a search of the *Cupressus macrocarpus* trees in the village yield any more individuals. — A. P. FOSTER, Ladn Vean, Grove Hill, Mawnan Smith, near Falmouth, Cornwall TR11 5ES.

THE GREY SHOULDER-KNOT: LITHOPHANE ORNITOPUS HUFNAGEL AT HAMPSTEAD. — I see our late colleague Baron de Worms regarded the occurrence of this moth at Woking to be worth a note (see *Ent. Rec.*, **91**: 220). Among the London records that I would have been sending to him is one of this species as the solitary catch in an actinic light trap at Hampstead on April 19th 1979. — A. A. SOFTLY, 12 Parliament Court, Parliament Hill, London NW3 2TS.

AUTUMN MIGRANTS, 1979. — Records of autumn migrants might find the following records at light at this address of interest: A male of the Four-spotted Footman (*Lithosia quadra* L.) came on 10th October and a male of the White-speck Wainscot (*L. unipuncta* Haw). on the 20th of October. Both nights very mild and "mothy" and both species are new for the home list and relatively unusual for Essex. — J. B. FISHER, Beaumont House, Beaumont-cum-Moze, Thorpe-le-Soken.

SCYTHROPIA CRATAEGELLA L. IN S.E. LONDON. — On 6th July 1979 I took a good specimen of this distinctive moth, the first I had ever met with, at m.v. light here. The fact that *S. crataegella* is not included in the long list of 'micros' in 'Woolwich Surveys' (1909), and that I never saw it at Blackheath during my years there with the lamp (1959-73), suggests that the species may be a newcomer to the area. If not, it must surely be very scarce in these parts. I have no information regarding its occurrence elsewhere in Kent; but possess an example taken by my friend Dudley Collins at his m.v. lamp, at Carshalton Beeches, near Croydon, in 1955.— A. A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.